

WHAT IS CLAIMED IS:

1. A method of generating adult stem cells comprising implanting at least one micro-organ derived from adult tissue in a mammal in a manner enabling migration of cells out of said at least one micro-organ, said cells being adult stem cells.

2. The method of claim 1, further comprising isolating said adult stem cells migrating out of said at least one micro-organ

3. The method of claim 2, wherein said adult stem cells are isolated from a biological fluid collected from said mammal.

4. The method of claim 1, wherein said at least one micro-organ is of dimensions selected such that cells positioned deepest within said at least one micro-organ are at least about 100 micrometers and not more than about 225 micrometers away from a nearest surface of said at least one micro-organ.

5. The method of claim 1, wherein said adult tissue is of a type selected from the group consisting of skin, kidney, lung, liver and bone marrow.

6. A method of inducing stem cells differentiation, the method comprising co-culturing isolated stem cells and at least one micro-organ, thereby inducing stem cells differentiation.

7. The method of claim 6, wherein said stem cells are adult stem cells.

8. The method of claim 6, wherein said stem cells are embryonic stem cells.

9. The method of claim 6, wherein said co-culturing is effected in a serum-free medium.

10. The method of claim 6, wherein said at least one micro-organ is of dimensions selected such that cells positioned deepest within said at least one micro-organ are at least about 100 micrometers and not more than about 225 micrometers away from a nearest surface of said at least one micro-organ.

11. The method of claim 1, wherein said at least one micro-organ is derived from an adult tissue of a type selected from the group consisting of skin, kidney, lung, liver and bone marrow.

~~12.~~ A method of inducing stem cells differentiation, the method comprising culturing isolated stem cells in micro-organ conditioned medium, thereby inducing stem cells differentiation.

13. The method of claim 12, wherein said stem cells are adult stem cells.

14. The method of claim 12, wherein said stem cells are embryonic stem cells.

15. The method of claim 12, wherein said micro-organ conditioned medium is serum-free medium.

16. The method of claim 12, wherein said at least one micro-organ is of dimensions selected such that cells positioned deepest within said at least one micro-organ are at least about 100 micrometers and not more than about 225 micrometers away from a nearest surface of said at least one micro-organ.

17. The method of claim 12, wherein said at least one micro-organ is derived from an adult tissue of a type selected from the group consisting of skin, kidney, lung, liver and bone marrow.

~~18.~~ A method of generating an artificial micro-organ comprising:

- (a) providing an acellular three dimensional scaffold, said acellular three dimensional scaffold being of dimensions selected such that when populated with cells, said cells positioned deepest within said scaffold are at least about 100 micrometers and not more than about 225 micrometers away from said cells positioned at a nearest surface formed on said scaffold; and
- (b) seeding said acellular three dimensional scaffold with cells at least until said cells repopulate said acellular three dimensional scaffold.

19. The method of claim 18, wherein said cells seeded on said acellular three dimensional scaffold are stem cells.

20. The method of claim 19, wherein said stem cells are adult stem cells.

21. The method of claim 19, wherein said stem cells are embryonic stem cells.

22. The method of claim 18, wherein said cells seeded on said acellular three dimensional scaffold are a mixed population of cells including stem cells, progenitor cells and differentiated cells.

23. The method of claim 18, wherein said cells seeded on said acellular three dimensional scaffold are genetically transformed to express at least one exogenous polypeptide.

24. The method of claim 19, wherein said stem cells are genetically transformed to express at least one exogenous polypeptide.

25. The method of claim 18, further comprising the step of generating said acellular three dimensional scaffold from a micro-organ.

26. The method of claim 25, wherein said step of generating is effected by subjecting said micro-organ to conditions selected suitable for removing cells and not acellular matrix from said micro-organ.

27. The method of claim 25, wherein said micro-organ is derived from an adult tissue of a type selected from the group consisting of skin, lung, kidney, liver and bone marrow.

28. The method of claim 25, wherein said stem cells are progenitor cells derived from the same source as said micro-organ .

~~29.~~ A method of isolating adult stem cells comprising culturing at least one micro-organ derived from an adult tissue in a culture and isolating

cells migrating out of said at least one micro-organ, said cells being adult stem cells.

30. The method of claim 29, wherein said culturing is effected under conditions suitable for maintaining said cells migrating out of said at least one micro-organ in an undifferentiated state.

31. The method of claim 29, wherein said culturing is effected under conditions suitable for propagation of said cells migrating out of said at least one micro-organ.

32. The method of claim 29, wherein said at least one micro-organ is of dimensions selected such that cells positioned deepest within said at least one micro-organ are at least about 100 micrometers and not more than about 225 micrometers away from a nearest surface of said at least one micro-organ.

33. The method of claim 29, wherein said adult tissue is of a type selected from the group consisting of skin, kidney, liver, lung and bone marrow.